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ABSTRACT

Publishers of elementary science teachers manuals present the components of each lesson plan in a variety of ways or modes. It was believed that teachers might prefer the modes used in presenting some lesson plan components more than others. A group of elementary teachers was given excerpts of teachers manuals in which publishers had presented various lesson plan components in different modes, and the teachers were asked to indicate which of the presentation modes they favored. The teachers' ratings of the alternative modes indicated that they did prefer some lesson plan component presentation modes over others. The teachers preferred: (1) a differentiated component over a combined one; (2) a question form in the plan heading over a topic form; (3) using explicit terms for instructional objectives and for beginning and ending suggestions; and (4) a list form of directions for conducting activities over a paragraph form. (Author/YP)

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TEACHERS' PREFERENCES CONCERNING THE WAYS TO PRESENT SELECTED COMPONENTS OF ELEMENTARY SCIENCE LESSON PLANS

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Abstract

Publishers of elementary science teachers manuals present the components of each lesson plan in a variety of ways or modes. It was believed that teachers might prefer the modes used in presenting some lesson plan components more than other modes. A group of elementary teachers was given excerpts of teachers manuals in which publishers had presented various lesson plan components in different modes, and the teachers were asked to indicate which of the presentation modes they favored. The teachers' ratings of the alternative modes indicated that they did prefer some lesson plan component presentation modes over other modes.

Teachers' Preferences Concerning the Ways to Present Selected Components of Elementary Science Lesson Plans

In most elementary schools, about once every five to 12 years, groups composed largely of elementary teachers select new science teaching materials. Some groups examine textbook series and teachers manuals for hands-on programs, such as Elementary Science Study (ESS), Science Curriculum Improvement Study (SCIS), and Science-A Process Approach (SAPA), and make their selections on the basis of their "feelings," while other groups use a check-list or a set of criteria against which each program is evaluated. Regardless of the method used in selecting science instructional materials, the adage that "six months after the selection of a new textbook series hardly a single teacher will admit to having served on the (selection) committee" (Talmage, 1981, p. 9) is as true concerning science instructional materials as it is for materials for other curricular areas.

Once science instructional materials arrive in the school building, many teachers evidently make minimal use of them. Talmage (1981) stated that:

> A look around most classrooms and learning centers reveals ... the under-utilization of available instructional materials.... We can all recall examples of how today's perfect textbook becomes tomorrow's dusty white elephant. Why this poor

> match between the purchased instructional materials and the intended users? Why do well-meaning teacher committees and learning center personnel come up with selections that have limited staying power? (p. .)

Perhaps a partial answer to this question is because the format and content of many instructional materials make them difficult for teachers to use. Bernstein (1985) pointed out that "... well-crafted books ... will free teachers to concentrate on higher levels of teaching and spare them the task of compensating for badly designed and poorly written books" (p. 465). Rather than compensating for poorly designed science teachers manuals, many teachers simply do not teach science. This situation prompted an investigation of teachers' preferences concerning the ways that selected components of lesson plans in elementary science teachers manuals are presented.

The Purpose of the Study

It was believed that the ways in which the various components of the lesson plans contained in elementary science teachers manuals are presented affect the manuals' usability, or would result in some manuals being easier to use than others. Therefore, the purpose of the study was to determine whether elementary teachers would express a preference for some ways or modes of presenting selected components of lesson

plans used in teaching elementary science over other modes of presentation.

The Design of the Study

Teachers manuals of nine elementary science programs were examined in order to identify specific lesson plan components presented in the manuals. Clear examples of the major modes that some publishers used in presenting selected lesson plan components were copied or cut from the manuals. Copies were made of the example modes of presentation and were given to 43 elementary teachers in graduate science education courses. The teachers taught grades K-6 and had from one to 24 years of teaching experience. The directions to the teachers and the examples comprised a total of 24 pages. The fact that most of the examples of the lesson plan components were actual copies of portions of teachers manuals prohibits their inclusion here. However, brief examples or descriptions of each lesson plan component selected for study and the different ways or modes that each component is typically presented in lesson plans are given below.

The teachers were asked to use a five-point rating scale to rate the presentation modes for each lesson plan component. A rating of one reflected a very weak preference for a lesson plan component presentation mode, and a rating of five reflected a very strong preference for a lesson plan component presentation mode.

An average of the 43 teachers' ratings was computed for each mode in which the lesson plan components were presented. The average ratings are given below in parentheses following the examples or brief descriptions of the lesson plan components and the modes that some publishers used in presenting each lesson plan component.

The Lesson Plan Components and Teachers' Ratings

In some teachers manuals it is obvious that an effort has been made to differentiate between and, insofar as was feasible, to separate the various lesson plan components. In other manuals, such as the ESS and SCIS manuals, various components of the lesson plans are all mixed up, that is, some teacher background information, some suggestions for discussions, and some of the directions for conducting an activity are all included in the same paragraph. The data indicated that teachers prefer manuals in which various lesson plan components are clearly differentiated (4.44) over manuals in which some lesson plan components have been combined or intermingled with other components (2.16).

Main lesson plan headings are usually stated in either topic form or question form. Examples of main headings stated in topic form are: "Habitat," "Energy from Burning," "Salt, Water and Food Coloring," and "Tallest to Shortest." Examples of main headings stated in question form are: "What nutrients does your body need?" and "How can we classify objects?" The

teacher respondents indicated they strongly prefer main lesson plan headings stated in question form (4.67) over headings stated in topic form. (2.42).

Publishers of some teachers manuals use a consistent format and sub-headings for major lesson plan components. For example, in one textbook series these lesson plan component sub-headings were used in virtually all lesson plans that comprise the series: "Concept," "Objective," "Science Words," "Science Refresher (Background Information)," "Motivation," "Teaching Pages...," and "Options." In other manuals, a wide variety of lesson plan sub-headings were used, and each sub-heading was used only once in the series. For example, these sub-headings were used only once in the SCIS manuals: "Watering Schedule," "Thinking About Seeds," "Mystery Objects," "Grandma s Button Box," "Looking at Wood Dust," "What Made the Water Turn Green?," "What's the Black Stuff?," "Get Set - Heading Out," and "Hiding in the Hay." Some of these sub-headings are good examples of headings that have been referred to as "cute rather than informative" (Bernstein, 1985, p. 467). The teacher respondents indicated they strongly prefer informative lesson plan sub-headings that are used throughout a manual (4.71) over other types of sub-headings that are used only once in a particular lesson plan and sub-headings that might be called "cute" (2.35).

Three types of statements are typically used in teachers manuals as instructional objectives: (1) Ends-oriented statements that describe desired pupil outcomes in clear terms, (2) Ends-oriented statements that describe pupil learnings in vague terms, and (3) Means-oriented statements that relate to what the teacher or pupils will be doing in the lesson. The teacher respondents indicated a strong preference for instructional objectives that are ends-oriented and stated in clear terms (4.69). However, they surprisingly indicated a slight preference for means-oriented statements (3.16) over ends-oriented statements stated in vague terms (2.47).

A very noticeable difference in teachers manuals is that designers of some lesson plans have made a clear distinction between each suggested activity in each lesson plan while designers of other manuals have not. For example, designers of the SAPA manuals labeled the first suggested activity in each module "Activity 1," the next suggested activity "Activity 2," and so on. In some lesson plans, teachers have to figure out how many different activities are suggested, and they also have to figure out where in a lesson plan each suggested activity begins and ends. The teachers' ratings indicated they prefer lesson plans in which the beginning and ending of each suggested activity is clearly noted (4.49) over lesson plans in which each suggested activity is not clearly identified (2.16).

In virtually all teachers manuals, one lesson plan component is directions or procedures for conducting the suggested activities. Such directions or procedures are given in either list form or in paragraph form. The teacher respondents indicated a strong preference for directions or procedures for conducting activities in list form (4.70) over directions or procedures given in paragraph form (2.40).

In some manuals suggested or example pre- and post-activity comments and questions are given in fairly explicit terms, such as, "You might begin the class by asking children, 'What do you think will happen if you add a drop of food coloring to the water?'" or in very general terms, such as, "Ask questions to stimulate a discussion of the experiments." The respondents indicated a preference for explicit pre- and post-activity suggestions or examples (4.33) over general suggestions or examples (2.44).

Berliner (1988) stated that model scripts might be designed for novice teachers, but holding experienced teachers to scripted lesson plans would be a terrible idea. The experienced teachers who participated in this study seem to prefer scripted lesson plans for teaching science over very general plans.

In some textbook teachers manuals, the point in each lesson at which the teacher should direct the pupils to read certain pages in the textbook, or a portion of a page, is

specified, while other manuals do not contain this information and leave this decision to teachers. The teacher respondents indicated a preference for lesson plans which it is indicated when pupils should be directed to read in the textbook (4.02) over manuals that that do not provide such information (2.14).

Summary and Discussion

The data in this study indicate that the elementary teachers who participated in the study had similar preferences concerning the ways that selected components of lesson plans should be presented in elementary science teachers manuals. The teachers indicated that they prefer the following features in elementary science lesson plans.

1. Lesson plans in which each component is differentiated and kept separate from other components, when feasible, are preferred over lesson plans in which two or more components are combined in a single paragraph or section.

2. Main lesson plan headings stated in question form are preferred over headings that are stated in topic form.

3. A lesson plan format in which each component of a lesson plan is clearly labeled for easy identification and, when feasible, includes the same informative and substantive sub-head titles in all lessons plans in a manual are preferred over formats that include the use of a variety of headings which are used only once in the manuals.

4. Instructional objectives that are ends oriented and stated in clear or explicit terms are preferred over other statements that are sometimes used as instructional objectives.

5. Lesson plans in which each suggested activity is clearly identified which enables teachers to quickly determine how many activities are included in each lesson plan, and enables them to quickly determine where in the lesson plan each activity begins and ends, are preferred over lesson plans that do not differentiate between the various suggested activities.

6. Lesson plans that contain directions for conducting the activities in list form are preferred over plans that have directions in paragraph form.

7. Lesson plans that have explicit suggestions concerning ways to commence lessons and to end them, or to summarize, close, or check for pupils' understanding of the main points emphasized in the lesson, are preferred over lesson plans that contain very general suggestions for beginning and ending lessons.

8. Lesson plans in textbook teachers manuals that specify the point in the lessons at which pupils are to read the narration in textbooks are preferred over plans that do not contain such infomration.

Through the years, such things as teachers' inadequate science background, lack of equipment, and not enough time to

teach science have been identified as reasons why many elementary teachers either teach science poorly or do not teach it at all. The data in this study suggest that teachers manuals that have not been designed for easy use may also contribute to ineffective science instruction in elementary schools.

When selecting new science teaching materials, if members of selection committees tend to agree with the findings of this study, they might consider using the above points as evaluation criteria to apply to the materials under consideration.

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